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ABSTRACT

This study compared the effectiveness of Learning 100 (L-100) with that of a conventional reading program in the Bedford Stuyvesant section of Brooklyn. L-100 is a multimedia, multimodal, multilevel communication skills system designed for use with undereducated adults, out-of-school youth, and potential dropouts. There were 49 in the experimental group and 47 in the control group; both groups met for nine hours per week. All students were given the Metropolitan Achievement Test, Reading Intermediate level, after 10 hours of instruction, and after 100 and 200 hours. To the extent that the sample is representative of the population from which it was drawn and that the teacher questionnaires, interviews, and testing instruments were valid for this population, it appears that significant differences in achievement favoring the L-100 group were attained. The L-100 system can be successfully managed by teachers who have had little previous experience with educational technology; for students, high interest and motivation are maintained and positive changes in attitude toward learning are exhibited as a result of the interest level of the reading selections and the instrumentation inherent in the system. (PT)

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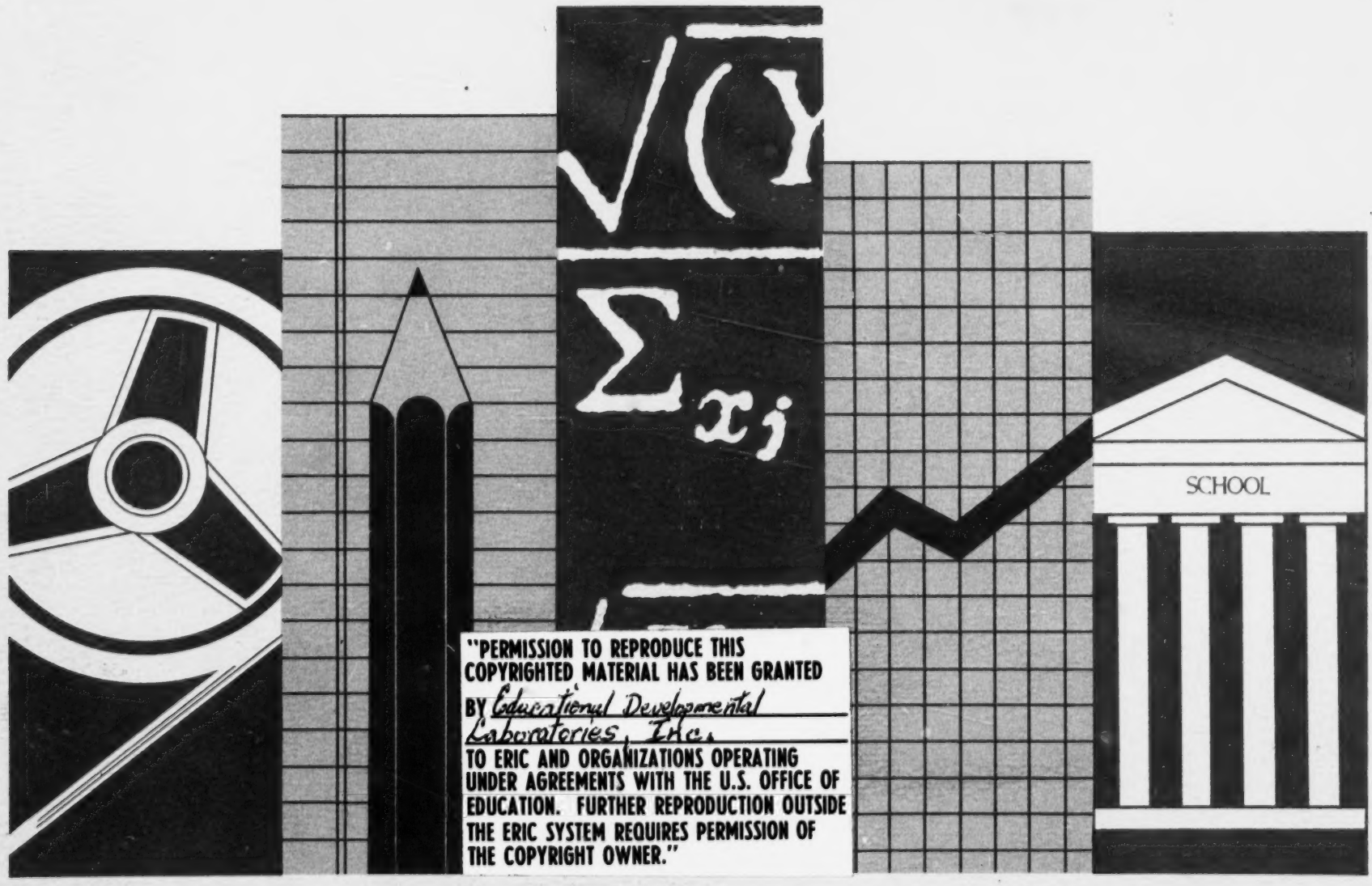

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Evaluation of Learning 100: An Adult Basic Education Project in Bedford-Stuyvesant, 1967-68

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Introduction

There are many adults who cannot function effectively in today's world because they lack basic literacy and communication proficiency. In different degrees, they lack the interest, self-confidence, and skills necessary to lift themselves above the level of functional illiteracy. For many such persons, the motivation to return to school has been nonexistent because school has been associated with frustration and failure.

For the students whose social-economic background has rendered them unable to cope with a traditional reading and language arts curriculum, EDL has created a new instructional program to answer the needs and capture the interest of mature people. This program provides a new approach through which these individuals may achieve academic success.

Learning 100 is a multimedia, multimodal, multilevel communication skills system designed for use by undereducated adults, out-of-school youths, and potential dropouts.

To initiate and maintain student interest, many of the media employed are different from those used in traditional, academically oriented programs, and the activities are varied.

To compensate for the relatively limited education of most undereducated adults, heavy stress is placed on the use of audiovisual techniques such as films, filmstrips, tapes, and recordings which offer the potential for maximum instruction and enrichment in a minimum amount of time. Many of the materials and techniques are self-pacing so that each student can progress at a rate which is suitable for him. To allow each student to enter the program at a point most appropriate to his instructional needs, a readiness stage and six graded levels of instruction are provided.

Purpose of the Study

This research study was conducted to compare the effectiveness of Learning 100 (L-100) in a ghetto situation with that of a more conventional reading program with subjects of similar backgrounds.

Subjects

In January 1968, under the Title III Adult Education Act of 1966, Adult Basic Education Program, an experimental and a control group were established in Bedford-Stuyvesant, a ghetto area in Brooklyn, New York. The Title III Program was sponsored by the Bureau of Continuing Education of the Board of Education of the City of New York with federal funds obtained through the State Education Department. The experimental group, those who were to use the Learning 100 system of instruction, consisted of two classes totaling forty-nine students, twenty-three in one class, twenty-six in the other. The control group consisted of two classes with twenty-three and twenty-four students, totaling forty-seven students.

Most of the experimental group were recruited from a low-income housing project. Classes were held at the project's Community Center. The control students were in an ongoing Youth In Action (YIA) stipended work training program of which the Adult Basic Education Program was a component. Control classes were held in YIA Neighborhood Centers.

The majority of people in these classes stated that they were there to improve their reading and arithmetic basic skills. Many were interested in eventually getting their High School Equivalency so as to be able to get jobs or get better jobs and earn more money. The functionally illiterate and the disadvantaged inner-city residents were represented.

Instructional Treatments Used

The experimental classes were taught reading and the allied communication skills by the Learning 100 Multimedia Communication Skills System produced by Educational Developmental Laboratories, Inc. Non-readers entered the program at the readiness level. Students reading at first-, second-, or third-grade levels entered the program at AA, BA or CA respectively. Students reading at fourth-, fifth-, or sixth-grade levels entered the program at DA, EA or FA respectively. The control classes used as their basic reading materials Science Research Associates (SRA) Kits and the Lippincott Reading for Meaning Series as well as supplementary reading materials. One of the control classes also used Getting The Facts, published by Barnell Loft.

L-100 classes met three evenings each week, three hours per session for a total of nine hours per week. The control group met an equivalent number of hours both in the evening and the late afternoon.

Methods and Instruments of Evaluation

In order that a comparative analysis might be made, each of the experimental and control classes was administered the *Metropolitan Achievement Test,*[1] Reading Intermediate level, after approximately ten hours of instruction, after approximately one

[1] *Metropolitan Achievement Test*, Reading Intermediate, Forms A, B, C, D, 1958-1962; Harcourt, Brace & World, Inc., New York, New York.

hundred hours, and after approximately 200 hours of instruction. This test was selected for use as it is the testing instrument currently being utilized by the City of New York. Experimental classes were given forms A, C, and B of the *Metropolitan Achievement Test* respectively; control classes were given forms C, D, and A respectively. The number of instructional hours (200) referred to earlier was the total amount of time spent in class work which also included mathematics and social living. Approximately two-thirds of the time (133 hours) was devoted to the language arts program which included the social living area.

Student attendance was recorded in hours during the first hundred hour period, during the second hundred hour period, and totaled for the entire two hundred hours.

Data on reasons for students' failure to complete the program were collected as well as dates of termination of participation for all students who left before the end of the course.

Records were kept of the level and cycle at which each student began Learning 100 and the level and cycle at which each student was working at the completion of the two hundred hours.

To acquire information regarding teacher reaction to Learning 100 and student growth and reaction to the instructional system as observed by the teachers, periodic questionnaires and interview techniques were utilized.

Methods of Analyzing Data

Subjective data collected by questionnaires and interviews were classified and summarized.

In order to analyze the objective data from this study, the Analysis of Covariance statistical technique was utilized. This statistical technique is used to equate groups when small initial differences between groups exist. Since different forms of the achievement test were administered to the groups, raw scores were converted to standard scores and these were used in the analysis.

Note that in Table 10 the mean standard score for the L-100 group was on the average initially more than three points lower than was the control group score. Therefore, it was necessary to statistically equate these groups in order that changes in scores on the posttest could be analyzed in relation to treatment effect (L-100) rather than differences due to initial achievement levels.

In addition, Pearson Product Moment correlations were computed for three sets of variables to determine the relationship between cycles completed and final standard scores, age and final standard scores, and years of school completed and final standard scores.

Description of Sample

At the time of registration, each student was required to complete a form issued by the State Education Department, Bureau of Basic Continuing Education. Demographic characteristics of participants in the program were obtained from this questionnaire. The data for those who remained in the classes throughout the study were analyzed in terms

of age, sex, race, marital status, children at home, years of formal schooling, area where schooling was completed, whether or not students were ever gainfully employed, whether or not they had received public assistance, and present occupation. Tables 1 through 5 summarize this data.

TABLE 1
DISTRIBUTIONS OF PARTICIPANTS BY AGE, SEX, AND RACE

Subjects	Number of Students	Age				Sex		Race		
		15-19	20-34	35-49	50+	Male	Female	White	Negro	No Response
L-100										
Number	37	1	10	23	3	2	35	1	36	0
Percent		2.7	27.0	62.2	8.1	6.0	94.0	2.7	97.3	0.0
Control										
Number	26	0	17	6	3	1	25	0	25	1
Percent		0.0	65.4	23.1	11.5	3.8	96.2	0.0	96.2	3.8

Table 1, a breakdown of participants by age, sex, and race, indicates that over ninety percent of the participants in both the experimental and control groups were female. The L-100 group was slightly older with approximately seventy percent of the subjects over thirty-five years of age whereas in the control group, sixty percent were below thirty-five years of age.

TABLE 2
DISTRIBUTIONS OF PARTICIPANTS BY MARITAL STATUS AND CHILDREN AT HOME

Subjects	Number of Students	Marital Status			Children at Home		
		Married	Single	No Response	None	1-3	4 or more
L-100							
Number	37	30	5	2	4	16	17
Percent		81.0	13.6	5.4	10.8	43.2	46.0
Control							
Number	26	17	9	0	9	11	6
Percent		65.4	34.6	0.0	34.6	42.3	23.1

More than three-fourths of the L-100 group reported that they were married (see Table 2). The younger control group reported almost three times as many single people.

TABLE 3

DISTRIBUTIONS OF PARTICIPANTS BY YEARS OF FORMAL SCHOOLING AND AREA WHERE SCHOOLING COMPLETED

Subjects	Number of Students	Years of Formal Schooling					Area Where Schooling Completed				
		0-3	4-7	8	9-12	12+	North East	South	Far West	Other Country	No Response
L-100											
Number	37	0	22	14	1	0	7	26	0	4	0
Percent		0.0	59.5	37.8	2.7	0.0	18.9	70.3	0.0	10.8	0.0
Control											
Number	26	0	5	4	16	1	6	16	1	2	1
Percent		0.0	19.3	15.4	61.5	3.8	23.1	61.6	3.8	7.7	3.8

Table 3 indicates that about sixty percent of the L-100 students reported that they had completed four to seven years of formal schooling whereas a similar number of control students reported that they had completed nine to twelve years of formal schooling. The majority of both groups completed their schooling in the South.

TABLE 4

DISTRIBUTIONS OF PARTICIPANTS BY STUDENTS EVER GAINFULLY EMPLOYED AND RECEIVING PUBLIC ASSISTANCE

Subjects	Number of Students	Students Ever Gainfully Employed			Public Assistance		
		Yes	No	No Response	Yes	No	No Response
L-100							
Number	37	37	0	0	9	13	15
Percent		100.0	0.0	0.0	24.3	35.1	40.6
Control							
Number	26	19	5	2	6	18	2
Percent		73.1	19.2	7.7	23.1	69.2	7.7

As indicated in Table 4, all the L-100 subjects reported that they had been gainfully employed at some time. Nineteen percent of the control subjects reported that they had never been gainfully employed. When questioned with reference to receipt of public assistance, forty percent of the experimental group and seven percent of the control group chose not to respond.

Table 5 shows the present occupation of the participants. More than half of the Learning 100 group responded that they were unemployed. All of the control subjects

indicated that they were presently unemployed. It was impossible to tell from the data whether those categorized as unemployed had part-time jobs.

TABLE 5
DISTRIBUTIONS OF PARTICIPANTS BY PRESENT OCCUPATION

Subjects	Number of Students	Present Occupation					
		Domestic	Service Trades	Semi-Skilled	Unskilled	Unemployed	No Response
L-100							
Number	37	2	3	1	5	23	3
Percent		5.4	8.1	2.7	13.5	62.2	8.1
Control							
Number	26	0	0	0	0	26	0
Percent		0.0	0.0	0.0	0.0	100.0	0.0

Teacher Experience and Training

The four teachers involved in the evaluation were selected by the supervisor of the Adult Basic Education Program (ABE) in the area. Both experimental and control teachers were asked by EDL to complete questionnaires with respect to their educational background and experience.

The two experimental and the two control teachers were Negro males who were New York City Board of Education licensed teachers holding down full-time positions during the day. All taught the ABE classes in the evenings in addition to their regular full-time assignments. Table 6 reports on their background and experience.

TABLE 6
EXPERIENCE AND EDUCATIONAL BACKGROUND OF EXPERIMENTAL AND CONTROL TEACHERS

Group	Average Age of Teachers	Average Years in Teaching	Degree Obtained		Experience With Disadvantaged	
			BS	BS+	Yes	No
L-100	46	16		2	2	
Control	30	4	1	1		2

All the teachers held bachelor's degrees and three had taken additional courses beyond the degree. Both L-100 teachers had more than 10 years of teaching experience including experience in reading instruction and working with the disadvantaged. The control teachers had less teaching experience and neither had taught disadvantaged students previously. However, one of them had worked with the socially maladjusted for nine

years. The L-100 teachers had previous in-service training in Adult Basic Education and all four were receiving concurrent in-service training in ABE.

EDL would have preferred that its system be tried by both experienced and neophyte teachers but the local administration felt it would be best if it were first tried by more experienced teachers only.

Teacher Orientation

To ensure successful implementation of the Learning 100 system, approximately twenty-five hours of orientation time was provided for the L-100 teachers. At the request of the Bureau of Continuing Education, the State Education Department authorized the funds to pay the teachers for their time.

A reading consultant from EDL acquainted the teachers with the materials and instructed them in the use of the instruments. However, during the early weeks of teaching, the teachers found that they had not become familiar enough with the specific procedures of the instructional system to use the program with complete confidence. The EDL consultant provided additional assistance during class sessions, on Saturdays, and via telephone.

Approximately forty hours of teacher training plus the availability of a consultant during the beginning weeks of instruction seem to be necessary for teachers who will be utilizing the EDL instructional systems.

Students Leaving the Program

During the study, twelve L-100 students and twenty-one control students did not complete their instructional program. Among these students were those who attended classes one or more times and left because of the reasons listed in Table 7.

TABLE 7
REASONS FOR LEAVING THE PROGRAM

Reasons for Leaving	Subjects	
	L-100 (49)	Control (47)
Employment	2	18
Health	1	1
Referred to High School Equivalency Program	3	0
Scored Beyond the Highest L-100 Level	4	0
Referred to Non-English-Speaking Class	0	2
Moved from City	2	0
TOTALS	12 (24%)	21 (44%)

Twelve of the forty-nine L-100 students or twenty-four percent of the total group left the program, while twenty-one of the forty-seven control students or forty-four percent failed to complete the 200 hours of instruction. Of the twelve L-100 students who withdrew from the program, more than half were transferred because they scored at the

High School Equivalency level or beyond the highest level of L-100. Eighteen control students and two L-100 students stated that they left the program for employment; several of the control students to serve as teacher's aides. Their hours of employment conflicted with the hours of the class meetings.

Student Attendance

The average number of hours of attendance during the first 100 hours of instruction, the second 100 hours of instruction and during the total course for the experimental and control groups is indicated in Table 8.

TABLE 8
COMPARISON OF STUDENT ATTENDANCE

Group	Number of Students	Average Hours of Attendance		
		First 100 Hours	Second 100 Hours	Total
L-100	37	83.43	73.97	157.40
Control	26	91.38	78.69	170.07

An examination of the average hours of attendance for both groups shows that the control students attended more hours on the average than the L-100 students. According to one of the L-100 instructors, a factor contributing to the lower L-100 attendance was that several of the students, due to conflicting hours of part-time employment, were able to attend only two of the three weekly meetings. It is also impossible to determine from the data how much of an influence existed between the control group's record of attendance and the stipend each control student received.

Number of Cycles and Levels Completed by L-100 Students

Since the L-100 system is organized into cycles and levels of instruction, it is interesting to note the progress of the L-100 students in the two experimental classrooms. In the L-100 system, the readiness level contains ten cycles and there are thirty cycles in each of the other levels. Each entering student was placed according to his reading level into an appropriate L-100 level of instruction.

Table 9 shows the number of students placed at each L-100 level at the start of the program and their level of attainment after approximately 133 hours of language arts instruction. At the beginning of the course seventeen students were working at level C (third-grade level) or below, but by the end of the course, only seven students were at level C, none were below that level. At the higher levels, twenty were working at levels D, E and F (fourth-, fifth-, and sixth-grade levels) at the beginning of the course, and by the end of the course thirty were at these levels. An inspection of Table 9 shows

that twenty-four of the thirty-seven students progressed through more than one level during the 133 hours of instruction.

The activities were scheduled in a free manner and students were permitted to skip cycles if the instructor judged them capable of handling the material. The average student covered 50.9 cycles or approximately one and two-thirds levels of instruction.

TABLE 9

L-100 LEVELS AT WHICH STUDENTS ENTERED PROGRAM AND L-100 LEVELS ATTAINED AFTER APPROXIMATELY 133 HOURS OF LANGUAGE ARTS INSTRUCTION

L-100 Level	Number of Students At Start of Program	Number of Students After 133 Hours of Instruction — L-100 Levels						
		R	A	B	C	D	E	F
R	2				2			
A	0							
B	5				2	1	2	
C	10				3	3	2	2
D	6						3	3
E	7						3	4
F	7							7
TOTAL	37				7	4	10	16

Results of the Statistical Analyses

Table 10 gives the results of the Analysis of Covariance for the *Metropolitan Achievement Test*. The pretest (alternate forms of the *Metropolitan Achievement Test*) administered after ten hours of instruction was used as a covariate in order to adjust groups for initial differences in ability. The posttest, administered after approximately 200 hours of total instruction including approximately 133 hours of language arts instruction, was used as the criterion measure or dependent variable.

It is difficult to generalize these results to the total population of functional illiterates because of the small sample size. The results are of interest, however, and provide an indication that use of the L-100 materials with a similar population could be advantageous.

Students who were instructed with the Learning 100 system scored significantly higher than the control group on the *Metropolitan Achievement Test* as is indicated by the 8.52 F value.

You will note in this table that the pretest standard score mean for the control class was 3.1 points higher than the pretest standard score mean for the L-100 students. When converted to grade scores, this constitutes an initial five-month advantage for the control pupils. However, when these pupils were tested at the end of the instructional period, you will note that the L-100 pupils scored 3.5 points higher than the control students after adjustments were made for pretest differences. This represents a seven-month grade equivalent difference in favor of the L-100 students. Also, when comparing the pretest standard score mean of the L-100 students to their posttest mean and the

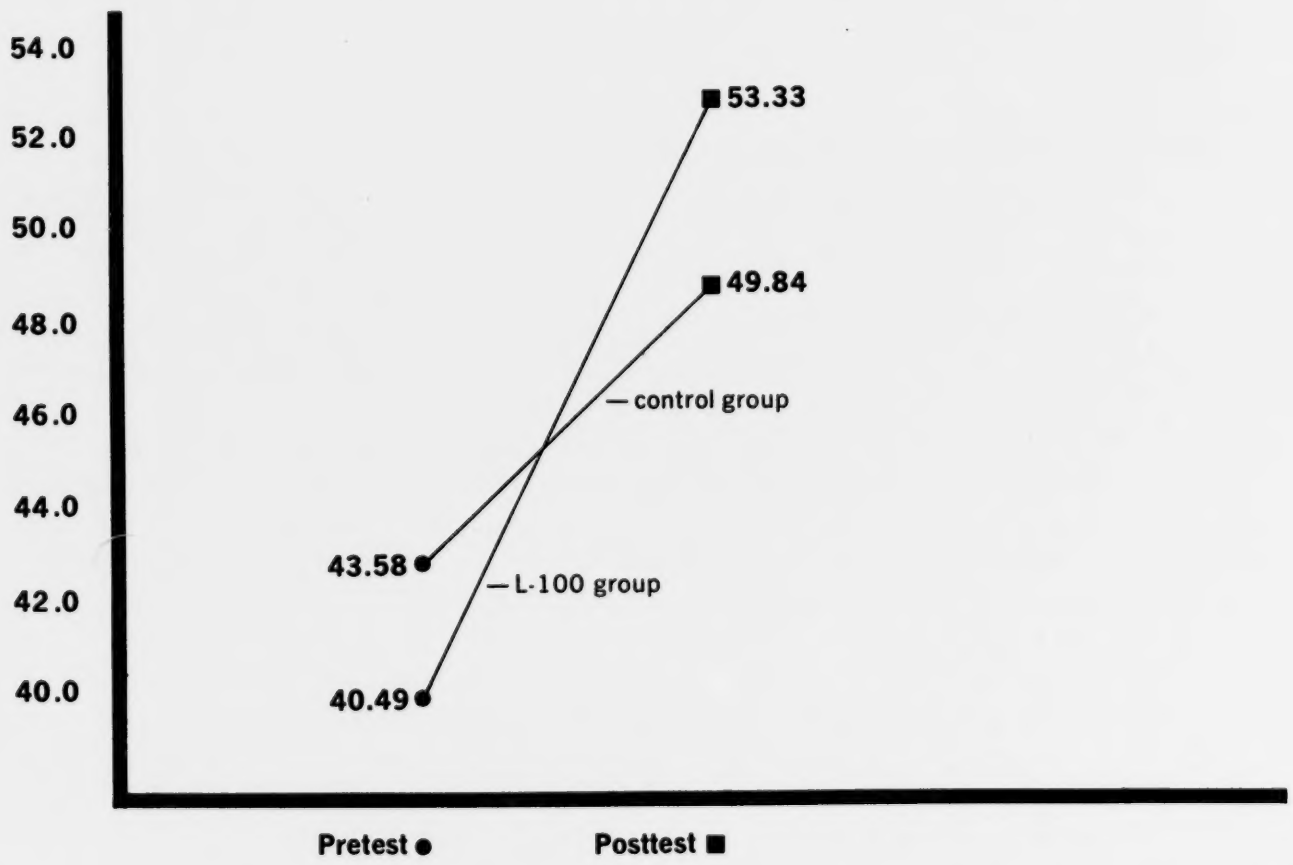
control pupils pretest standard score mean to their posttest mean, you will note that the experimental students (L-100) made a proportionately greater gain than the control students; the L-100 students gained thirteen standard score points, a grade equivalent gain of nineteen months; the control students gained six standard score points, a grade equivalent gain of twelve months. The nineteen-month gain for L-100 students is in line with the actual expectation of L-100 where thirty cycles are judged to affect a one grade level change.

TABLE 10

PRETEST STANDARD SCORE MEANS AND POSTTEST ADJUSTED AND UNADJUSTED STANDARD SCORE MEANS FOR EXPERIMENTAL AND CONTROL GROUPS

		Metropolitan Achievement Test, Reading			
		Pretest	Posttest		
Group	Number of Pupils	Standard Score Mean	Unadjusted Standard Score Mean	Adjusted Standard Score Mean	F
L-100	37	40.49	52.62	53.33	8.52*
Control	26	43.58	50.85	49.84	

* Highly significant at the 1 percent level with 1 and 60 degrees of freedom.



Graphic Representation of Pretest and Posttest Standard Score Means for Experimental and Control Groups Following Approximately 133 Hours of Instruction

Figure 1.

Correlation

To assess the relationships that exist between certain variables and the test scores of the L-100 students, correlation coefficients (r) were computed. These coefficients of correlation are listed below:

r between cycles completed and standard scores	.25
r between age and standard scores	−.08
r between last grade attended and standard score	.43

The correlation of .25 between cycles completed and standard scores was a positive but slightly less than significant correlation. This shows that subjects who completed more cycles achieved at a higher level. The correlation of the age variable with standard score was small and is approaching zero, indicating little correlation between age and test scores for this group. The correlation of .43 between last grade attended and standard score is highly significant and would be expected. This indicates that those students who completed more years of schooling achieved at a higher level.

Subjective Evaluation

The questionnaires completed by the teachers and the interviews held with them during the year dealt with information concerning 1) teacher opinion with respect to the major advantages of the instructional program and suggestions for improvements of the system, 2) teacher opinion of student reaction to the instruments and materials, 3) enrichment activities that were most successful, and 4) classroom management.

The teachers listed as major advantages of the L-100 instructional system:

L-100 aids in raising the aspirational levels of students. It provides opportunities for students to strive for higher levels.

Students can evaluate their own progress.

Initial interest is high and is maintained for long periods of time.

The system possesses flexibility.

Students develop a new interest in learning.

Encourages outside reading.

Allows the students to go ahead at their own rate.

One of the teachers stated, "Everything seems to have worked for us. I think the instruments have caused great interest and motivation and helped to increase the students' reading skills so that their goals are more easily accomplished. I think the support of the teachers was a contributing factor to the success of the program."

In their suggestions for additions to the system, they expressed a need for more instruction in writing skills on the upper levels; for example: how to write personal and business letters. It was felt that some students needed more practice than was provided.

In relation to teacher training, the teachers suggested that the EDL teacher consultant should work through complete cycles of instruction to better enable instructors to see all the related materials that are necessary for a complete lesson, and how these materials are utilized and interrelated. They would also have preferred a more thorough orientation as to the functioning and servicing of each instrument.

The students' reactions to the materials, instruments, and the system as a whole, as reported by the teachers, were quite favorable. Some comments of the teachers regarding their observations of the students are as follows:

> After using a combination of Study Skills Library and Listen and Write, a good discussion resulted. After class the students said they felt they were getting a lot out of this program, they were seeing each other differently. They didn't really communicate previously.
>
> Some of the students express a renewed desire to read more at home. They are reading newspapers and paperback books and comprehending more.
>
> Student interest in learning has heightened. When talking to other students in the class, they seem to feel they have been helped by the class. They seem to be able to communicate better.
>
> Most of the students have realized all along that they need a high school diploma or equivalency diploma to get jobs. Now many of the students realize the importance of schooling for self improvement as well as for job improvement.
>
> Learning 100 has given them better insight into their own abilities and has increased their self-confidence.
>
> The adults who had children in school were motivated to become more concerned about their children's schooling. In addition, they could show their children that they had the initiative to get education and thereby motivate their children to continue.

In regard to student reaction to the instruments, one teacher indicated that all his students were able to operate the Controlled Reader Jr. and all but four of the class could operate the Aud-X. These four were reluctant to try, possibly for fear of breaking the instruments. About half of the other class never tried to operate the Aud-X as they did not want to be responsible for any damage to the instruments and were quite content to have other members of the group, usually the younger ones, take over. Several in this class would not try to operate the Controlled Reader Jr. The remainder had no difficulty.

Since the students worked in small groups with one person assigned to operate the instrument, the lack of desire on the part of some of the students to attempt to operate the instruments presented no problem.

For the adults in the class who were reluctant to handle the instruments because they might break, not function correctly, or be uncomfortable to use (earphones), the teachers suggested that it would be helpful to have Educational Developmental Laboratories prepare a film that would attempt to dispel these fears.

In rating the materials, the teachers indicated that the Aud-X, Tach-X, Controlled Reader and their accompanying materials, as well as the Study Skills Library, were rated as having good to outstanding instructional value. They considered the Flash-X discs to be of least instructional value. These also generated least student interest. The Controlled Reader and its accompanying materials generated outstanding student interest. The students responded very positively to the Controlled Reader stories which were created especially for this population, at their reading level and their interest level.

Both teachers stated that initially more time was required for class preparation using L-100 as compared to more traditional methods. However, once the system had been set up, much less time was consumed in preparation.

At the culmination of each cycle, a variety of enrichment activities are suggested in the Cycle Lesson Plans. The teachers were asked which of the activities suggested during the enrichment section were most successful. They reported as follows:

> Discussions pertaining to their own everyday problems such as credit, welfare, unfair rents, schooling of children, mistakes parents make in raising children, budgeting and getting the most for their money, experiences with banks and loan companies, responsibilities of government, high school equivalency and civil service examinations were very successful. Initially, the students were very reticent, but they became less self-conscious in their discussions as time progressed.
>
> Use of the tape recorder with EDL Listening tapes, and recording their own voices were beneficial activities. Many were surprised to hear that they slurred word endings.
>
> Individual speeches of two minutes about any topic that interested them were favored.
>
> A visit to the theatre, for most their first Broadway show, was exciting.

The control teachers listed as major advantages of their instructional materials that the students could work individually and progress at their own rate. However, they indicated that the reading materials were not challenging enough. Some of the materials if used daily seemed to become boring. The teachers suggested that possibly this was because of lack of group involvement and discussion. In order to increase and maintain student interest, one of the control teachers used a timing technique to motivate the students by developing either self-competition or competition between members of the class.

Conclusions

To the extent that this sample is representative of the population from which it was drawn, and to the extent that the teacher questionnaires, interviews, and testing instruments were valid for this population, the following conclusions can be drawn:

1. The adult-oriented content of Learning 100 combined with instrument usage appears to maintain the interest of the undereducated adult.
2. The structure of Learning 100 allows each student to start at a point most appropriate to his instructional needs and to progress at his own rate.
3. Involvement with Learning 100 appears to increase self-confidence.
4. Involvement with Learning 100 seems to reactivate interest in learning and seems to raise literacy levels and economic potential for the students.
5. Involvement with Learning 100 seems to cause students to become more interested in their children's schoolwork.
6. Although teachers of experimental classes initially experienced difficulties, once they got started they soon became comfortable and competent with the Learning 100 system of instruction and seemed pleased with the outcomes.
7. Disadvantaged adults utilizing the Learning 100 system of instruction scored at a highly significant ($p < .01$) level above the control group on the *Metropolitan Achievement Test*, Reading Intermediate level.
8. Level of previous schooling correlates highly (.43) with standard scores of those students utilizing Learning 100.

9. A small negative correlation (−.08) was found between age and standard scores of those students utilizing Learning 100.

In summary, under the restrictions previously stated, it appears that significant differences in achievement favoring the Learning 100 group were attained in this sample. In addition, the Learning 100 system can be successfully managed by teachers who have had little previous experience with educational technology; for students, high interest and motivation are maintained and positive changes in attitude toward learning are exhibited as a result of the interest level of the reading selections and the instrumentation inherent in the instructional system.

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